

REMARKS

Description corresponding to the new language of claims 11 and 12 and amended claim 6 is found at pages 13-15 of applicants' specification. Note, in particular, that the "center 10" is defined as both the center of the single crystal, e.g. at page 15, lines 9-22, and as the center of the fusion ring, e.g. at page 13, lines, 9-11. Description corresponding to new claim 13 is found at page 13, lines 4-6 of applicants' specification.

The rejections for obviousness over Japanese "Kokai" 02-102187 in view of Japanese "Kokai" 10-226592 are both respectfully traversed. The examiner acknowledges that the primary reference does not disclose or suggest the use of more than one measuring line and relies on the secondary reference for a teaching "that more than one means is used to measure a fusion ring during czochralski method," quoting from the office action.

However, in reviewing the Derwent English language abstract for the secondary reference (Kokai 10-226592) and the English language abstract published by the Japanese Patent Office (copy attached) the undersigned can find neither the "more than one means" referred to by the examiner or the use of more than one measuring line. On the contrary, the English language abstracts for the secondary reference are quite clear to the effect that only a single measuring line, i.e. the photometric line of the camera, is used.

Neither the primary reference nor the secondary reference discloses or uses a method which employs more than one measuring line or device which creates more than one measuring line in a captured image.

With regard to the secondary reference in particular, Japanese Kokai 10-226592 discloses a method of measuring “a crystalline diameter with high precision around the whole periphery of the crystal,” quoting from the JPO English abstract, emphasis added. According to the method disclosed by this secondary reference, the center of the fusion ring is detected based on the luminance distribution along a line horizontal through the image. Further, the position of the fusion ring is determined based on the luminance distribution vertically through the detected center of the fusion ring and the distance corresponding to the radius of the single crystal is determined as the peak-to-peak horizontal distance. However, this method requires that the side of the fusion ring facing the measuring device be observed in its entirety while the single crystal is being pulled. In some cases, the measurement can not be effected, depending on the pulling conditions, the structure of the single crystal growing apparatus, and so forth.

In contrast to the prior art references, the present invention provides a method for determination of the center of the fusion ring even if only a portion of the fusion ring, at one side of its center, can be observed while the single crystal is being pulled. Further, the present invention allows for determination of the center of the fusion ring with a smaller amount of calculation, as compared to the methods employed by the primary and secondary references.

The rejection of applicants’ dependent claims is predicated on the erroneous assumption that the references disclose plural measurement lines. Further, the examiner mischaracterizes the dependent claims as all relating to “placement of the measurement lines” whereas, in point of fact, the dependent claims are directed to features other than “placement of the measurement lines.” Accordingly, it is

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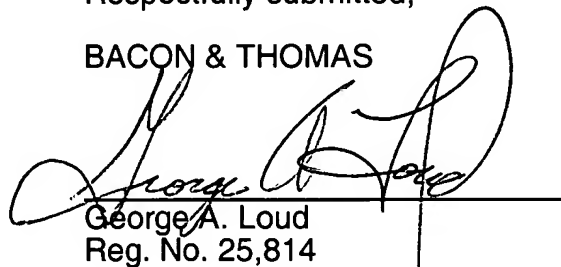
respectfully submitted that the examiner has not stated a prima facie case for obviousness with respect to any of the dependent claims.

Further, it is respectfully submitted that newly added claims 12 and 13 serve to further distinguish the present invention from anything conceivably suggested by the combined teachings of the references.

Accordingly, reconsideration of the rejections of record is respectfully requested.

Respectfully submitted,

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